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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/914,870	01/28/2002	Marcus Hartmann	P67083US0	4106

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EXAMINER	
AKHAVAN, RAMIN	
ART UNIT	**PAPER NUMBER**
1636	

DATE MAILED: 02/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

2/06/05 RA

Office Action Summary	Application No.	Applicant(s)	
	09/914,870	HARTMANN ET AL.	
	Examiner	Art Unit	
	Ramin (Ray) Akhavan	1636	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 November 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) *1-6 and 10* is/are pending in the application.

4a) Of the above claim(s) *7-9* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6 and 10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10/30/01*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Receipt is acknowledged of a response filed 11/22/2004. Claims 1-6 and 10 are pending and under consideration in this action.

Election/Restrictions

Applicant's election with traverse of Group III, claims 1-6 and 10 is acknowledged (Response, filed 11/22/04). The traversal is on the grounds that recombinant expression always requires introduction of nucleic acids into a host organism and expression of the encoded protein therein, with respect to Groups III and IV. Furthermore, Applicant asserts that Group I and II are encompassed within the special technical feature of recombinant expression of β-hexosaminidase.

Applicant's arguments are not found persuasive because use of a protein is a distinct special technical feature as compared to use of nucleic acid molecules. First, nucleic acid molecules as compared to protein/peptide molecules, by definition, are drawn to distinct special technical features, by virtue of their biologically distinguishable structures and correlative functions for said structures. In other words, a nucleic acid molecule and a protein molecule have distinct functions, thus distinct special technical features. Therefore unity of invention does not exist as between the inventions that are directed to nucleic acid molecules and protein molecules (Groups I and II respectively).

Therefore, it follows, that processes utilizing a protein are distinguishable from processes utilizing nucleic acid molecules. For example, the peptide could be used in a process to raise antibodies, which would necessarily constitute a distinct special technical feature in itself.

Put another way, the claimed use defines the special technical feature. Expressing a protein is a special technical feature that does not in itself require the protein for functionality. Therefore, contrary to Applicant's assertion Groups III and IV do not share a special technical feature. The requirement is still deemed proper and is therefore made FINAL.

Specification

The specification lacks proper arrangement and section headings. For example, there are no section headings anywhere in the specification. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use:

> As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:
>
> (a) TITLE OF THE INVENTION.
> (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
> (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
> (d) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC (See 37 CFR 1.52(e)(5) and MPEP 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text are permitted to be submitted on compact discs.) or
> REFERENCE TO A "MICROFICHE APPENDIX" (See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.)
> (e) BACKGROUND OF THE INVENTION.
> (1) Field of the Invention.
> (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
> (f) BRIEF SUMMARY OF THE INVENTION.
> (g) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
> (h) DETAILED DESCRIPTION OF THE INVENTION.
> (i) CLAIM OR CLAIMS (commencing on a separate sheet).
> (j) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
> (k) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

Applicant should incorporate the proper section headings into the specification where applicable (e.g., Brief Description of the Drawings, etc.).

Sequence Compliance Rules

Figures 1 and 2 disclose sequenced that are not properly identified with sequence identifiers (i.e. "SEQ ID NO:"). Sequence Listing, See 37 CFR 1.821-1.825 and MPEP §§ 2421-2431. The requirement for a sequence listing applies to all sequences disclosed in a given application, whether the sequences are claimed or not. See MPEP § 2421.02. If said sequences were originally submitted in both electronic and paper format, then applicant is only required to make proper amendment to the Brief Description of the Drawings (i.e. with proper sequence identifiers). However, if applicant has not previously submitted said sequences, then a new submission is also required (i.e. CD-ROM/CD-R, Paper Filing and Attorney Declaration).

The description for Fig. 1 (Spec. p. 4) only indicates that the sequence is that of a β-hexosaminidase, but does not actually identify the sequence as SEQ ID NO:1. Furthermore, a sequence identifier should be capitalized wherever it is used. In addition, the description for Figure 2 is ambiguous as to which sequence (i.e., SEQ ID NO) is actually depicted in Fig. 2. For example, the description indicates that Fig. 2 "shows a corresponding expression product...according to [SEQ ID NO: 1]", but clarification is needed to specify that SEQ ID NO: 1 is the sequence disclosed in Fig. 1. Furthermore, the description states, "The invention also relates to this protein according to SEQ ID NO: 2"; It is unclear how this sentence is to be interpreted. It would be remedial to identify Fig. 1 as SEQ ID NO:1 and Fig. 2 as SEQ ID NO: 2.

Claim Objections

Claims 1-6 and 10 are objected to because of the following informalities:

The claims should be preceded with the phrase "What is claimed is:" or similar language. Claims 1 and 10 recite the phrase "homologous or heterologous recombination ("knock-out["], "gene replacement")." An end quote symbol should be inserted for the term "knock-out".

Claim 3 is objected to because the term Seq. Id. No. 1 should be capitalized.

Claim 4 is objected to because it recites an amino acid sequence without a proper sequence identifier.

Claim 5 recites that the nucleic acid (of claim 1) is to be combined with "other nucleic acids" which in effect encompasses all known DNA or RNA from any source. Claim 5 further recites "sequences of any kind" with which the nucleic acid is combined, where sequences are selected from a list of organisms that encompasses every living thing on earth. Therefore claim 5 is objected to for containing redundant or superfluous language, because the limitation "other nucleic acids" already encompasses "sequences of any kind".

Claim 6 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 6 depends from claim 5, which is drawn to the nucleic acid (or parts thereof) coding for a β-hexosaminidase, where the nucleic acid is combined with "with any other nucleic acid" (claim 5). Claim 6 further expands the scope where said nucleic acid is incorporated into "any kind of circular or linear DNA or RNA".

Therefore, claim 6 does not further limit claim 5. In addition, claim 6 is objected to because the acronym "IS" is not properly defined with the corresponding term (i.e., insertion sequence).

Claim 10 is objected to because it is dependent from a withdrawn claim (i.e., claim 8). Therefore the claim could be withdrawn from further consideration. However, in the interest of furthering prosecution the claim will be examined as if written in independent form with all the intervening limitations. In other words, the nucleic acid (in claim 10) is interpreted to be one that encodes the amino acid sequence recited in claim 4 or claim 7 (SEQ ID NO: 2). Appropriate correction is required for the foregoing objections.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

1. **The claimed invention is directed to non-statutory subject matter.**

More particularly, Claims 1-6 and 10 are rejected under 35 U.S.C. 101, because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd.* v. *Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

2. **Claims 1-6 and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

Claims 1-6 and 10 provide for the use of a nucleic acid or protein, but, since the claims do not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claim 2 recites the term "extracellular β-hexosaminidase" which is not particularly defined in the specification. For example, the term "extracellular" can be interpreted to mean production of said protein in a cell free *in vitro* expression system. Alternatively, extracellular can be interpreted to mean the protein is bound on the cell's surface. Additionally, extracellular can mean the protein is secreted out from the cell. As written the claim's metes and bounds are indeterminable.

Claim 3 recites the term "said nucleic acid [as] shown in Figure 1, especially that of [SEQ ID NO: 1]". The claim as written is incomprehensible, because Fig. 1 only depicts one sequence, thus the phrase "especially that of [SEQ ID NO:1]" confers ambiguity as to what is being claimed, because the claim is already directed to SEQ ID NO: 1. As such the claim's metes and bounds are unclear.

Claim 5 recites the term "usual" in referring to something with which a nucleic acid or parts thereof encoding β-hexosaminidase are combined. It is unclear what the term "usual" is referring to thus conferring ambiguity and indefiniteness with respect to the claim's metes and bounds. Furthermore, claim 5 recites the phrase, "sequences of any kind", which is vague and indefinite. For example, does this mean that the nucleic acid molecule is combined with amino acid sequences? In addition, the claim recites a series of terms that delimit particular compositions to which the nucleic acid is to be combined, but the claim is simply unintelligible. For example, it is unclear how the claim should be interpreted if a nucleic acid molecule is combined with "origins" or "operators" or "antibiotic resistances".

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. **Claims 1-6 and 10 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement.**

The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. More particularly, the claims are directed to nucleic acids or "parts thereof" encodes β-hexosaminidase from any ciliate organism.

Therefore, the claims are directed to a genus in terms of particular nucleic acid or "parts" (i.e., fragments) that encode a particular function. Since a single amino acid change (e.g., mutation, substitution or deletion, affecting folding or secondary structure) can affect protein functionality, and there are potentially thousands of nucleic acid molecules or "parts" that have not been identified. With respect to claim 4, the genus is limited to an embodiment that at least comprises the amino acid sequence recited in claim 4, however the limitation is not exclusive, in that the nucleic acid molecule is still drawn to "parts thereof", especially since claim 4 recites "having" when referring to the particular amino acid sequence. In other words, claim 4 is directed to a subgenus of the broader genus of claim 1.

The written description requirement for a claimed genus may be satisfied by sufficient description of a representative number of species by actual reduction to practice, reduction to drawings or by disclosure relevant identifying characteristics, i.e. structure or other physical and/or chemical properties, by functional characteristics coupled with a known or disclosed correlation between function and structure or by a combination of such identifying characteristics sufficient to show applicant was in possession of the claimed genus. The Guidelines for Written Description state:

> "The claimed invention as a whole may not be adequately described if the claims require an essential or critical feature which is not adequately described in the specification and which is not conventional in the art" (Federal Register/ Vol. 66, No. 4/Friday, January 5, 2001/Notices, column 1, page 1105).
>
> The Guidelines further state, "[t]he claim as a whole, including all limitations found in the preamble, the transitional phrase, and the body of the claim, must be sufficiently supported to satisfy the written description requirement" (at page 1105, center column, third full paragraph). An applicant shows possession of the claimed invention by describing the claimed invention with all of its limitations. *Lockwood v. American Airlines Inc.* (CA FC) 41 USPQ2d 1961 (at 1966).

The specification does not contain any examples of fragments or parts corresponding to nucleic acid molecules that encode the requisite activity.

Therefore the disclosure is not descriptive of the complete structure of a representative number of species, which the claims encompass, as one of ordinary skill in the art cannot envision all "parts thereof" based on the teachings in the specification. In effect, the instant disclosure contains an omission of a sufficient number of embodiments encompassed by the claimed genus. Furthermore, this omission is not supplemented by the knowledge in the art in regard to clarification of particular nucleic acid fragments that encode the requisite activity of a β-hexosaminidase from any ciliate organism.

Given the enormous breadth of the nucleic acid molecules encompassed by the rejected claims, and given the limited description from the instant specification of such nucleic acids, the skilled artisan would not have been able to envision a sufficient number of specific embodiments to describe the broadly claimed genus of fragments encoding β-hexosaminidase activity from any ciliate organism. Moreover, an applicant claiming a biotechnological invention cannot necessarily claim a genus after only describing a limited number of species because there may be unpredictability in the results obtained from other species. In sum it must therefore be considered that the single disclosed species is not a representative number of species sufficient to convince the skilled artisan that applicant is in possession of the claimed genus.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. **Claims 1-3 and 5-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Aerts (US 5,928,928; the '928 patent).**

Given that the claims are indefinite and vague as stated above, the claims are interpreted as broadly as reasonable to be directed to use of nucleic acid fragments (i.e., parts thereof) in recombinant protein expression, where a "part thereof" can comprise any nucleic acid fragment. In other words, since there is ambiguity as to the identity of said fragments, the claims read on any recombinant protein expression. Therefore, a single nucleic acid(s) would necessarily meet the limitation "parts thereof". All dependent claims would similarly comprise said limitation. Additional limitations are directed to the nucleic acids incorporated in a sequence of any kind (claim 5) or any linear/circular nucleic acid (claim 6)

The '928 patent teaches recombinant protein expression, utilizing nucleic acid molecules encoding chitinase. (e.g., col. 19, Example 2). Therefore, the nucleic acid molecules used would necessarily comprise nucleic acid(s) that are "parts" of the nucleic acid in instant claims. Therefore, the '928 patent anticipates the rejected claims.

5. **Claims 1-3, 5-6 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Lacoste et al. (J. Biol. Chem. 1992; 267:5941-48).**

The claims are interpreted consonant with the interpretations stated above.

Lacoste et al. teach recombinant expression of a β-hexosaminidase from a ciliate (i.e., Dictyostelium). (e.g., Abstract; p. 5943, col. 1, Experimental Procedures; p. 5946, fig. 5). Therefore, the rejected claims are anticipated.

Conclusion

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ray Akhavan whose telephone number is 571-272-0766. The examiner can normally be reached between 8:30-5:00, Monday-Friday. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Remy Yucel, PhD, can be reached on 571-272-0781. The fax phone numbers for the organization where this application or proceeding is assigned are 571-273-8300 for regular communications and 703-872-9307 for After Final communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Respectfully submitted,

Ray Akhavan/AU 1636

GERRY LEFFERS
PRIMARY EXAMINER